

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-21. (Cancelled)

22. (withdrawn) A substrate with a plurality of concave portions, the substrate being manufactured by the method defined by claim 1 or 14.

23. (withdrawn) A substrate with a plurality of concave portions for microlenses, the substrate being manufactured by the method defined by claim 1 or 14.

24. (withdrawn) A microlens substrate with a plurality of microlenses, the microlens substrate being manufactured using the substrate with a plurality of concave portions defined by claim 23.

25. (withdrawn) A transmission screen comprising:

the microlens substrate with a plurality of microlenses defined by claim 24;

a Fresnel lens portion with a Fresnel lens, the Fresnel lens portion having an emission face and the Fresnel lens being formed in the emission face wherein the microlens substrate is arranged on the emission face side of the Fresnel lens portion; and

a light diffusion portion arranged between the Fresnel lens portion and the microlens substrate.

26. (Cancelled)

27. (withdrawn) The transmission screen as claimed in claim 25, wherein the diameter of the microlens is in the range of 10 to 500 μm .

28. (Cancelled)

29. (withdrawn) The transmission screen as claimed in claim 25, wherein the light diffusion portion is adapted to diffuse light so that the light is diffused on a substantially entire surface of the light diffusion portion.

30. (withdrawn) The transmission screen as claimed in claim 25, wherein the haze value of the light diffusion portion is in the range of 5 to 95%.

31. (withdrawn) The transmission screen as claimed in claim 25, wherein the glossiness of the light diffusion portion is in the range of 5 to 40%.

32. (withdrawn) The transmission screen as claimed in claim 25, wherein the surface of the light diffusion portion has an irregularities comprised of roughly subulate concave portions.

33. (withdrawn) The transmission screen as claimed in claim 25, wherein the light diffusion portion includes a resin sheet having one roughened surface.

34. (withdrawn) The transmission screen as claimed in claim 25, wherein the diameter of the microlens is in the range of 10 to 500 μ m.

35. (withdrawn) A rear projector comprising:
the transmission screen defined by claim 25;
a projection optical unit; and
a light guiding mirror.

36. (Cancelled)

37. (new) A method of manufacturing a substrate with a plurality of concave portions, the method comprising the steps of:

preparing a substrate;

forming a first mask on the substrate;

forming a plurality of first initial holes in the first mask by one of a physical method and irradiation with laser beams;

forming a plurality of first concave portions in the substrate by subjecting the substrate provided with the first mask having the plurality of first initial holes therein to a first etching process;

removing the first mask after the first etching process;

forming a second mask on the substrate in which the plurality of first concave portions have already been formed;

forming a plurality of second initial holes in the second mask by one of the physical method and irradiation with laser beams;

forming a plurality of second concave portions in the substrate by subjecting the substrate provided with the second mask having the plurality of second initial holes therein to a second etching process; and

removing the second mask after the second etching process;

wherein the plurality of concave portions include the plurality of first concave portions and the plurality of second concave portions.

38. (new) The method as claimed in claim 37, wherein the physical method includes blast processing.

39. (new) The method as claimed in claim 38, wherein the blast processing employs glass beads as blast media.

40. (new) The method as claimed in claim 38, wherein the blast processing employs a blast media having an average diameter in a range of 20 to 200 μm .

41. (new) The method as claimed in claim 38, wherein the blast processing comprises spraying blast media with the blast pressure in a range of 1 to 10kg/cm².

42. (new) The method as claimed in claim 38, wherein the blast processing comprises spraying blast media with a blast density in a range of 10 to 100 kg/m².

43. (new) The method as claimed in claim 37, wherein each of the first and second masks comprises Cr or chromium oxide as a main component.

44. (new) The method as claimed in claim 37, wherein an average thickness of each of the first and second masks is in a range of 0.05 to 2.0 μm .

45. (new) The method as claimed in claim 37, wherein each of the first and second etching processes includes a wet etching process using at least one of ammonium hydrogen difluoride and ammonium fluoride as an etchant.

46. (new) The method as claimed in claim 37, wherein the first concave portions and the second concave portions are randomly arranged on the substrate.

47. (new) The method as claimed in claim 37, wherein the substrate comprises alkali-free glass.

48. (new) The method as claimed in claim 37, wherein the plurality of first and second concave portions are shaped for manufacturing microlenses.

49. (new) The method as claimed in claim 37, wherein the step of forming the first concave portions is performed under first conditions and the step of forming the second concave portions is performed under second conditions, the first conditions being different from the second conditions.

50. (new) The method as claimed in claim 49, wherein a size of the first initial holes is different from a size of the second initial holes.

51. (new) The method as claimed in claim 49, wherein a side-etching rate of the first etching process is different from a side-etching rate of the second etching process.

52. (new) A substrate with a plurality of concave portions, the substrate being manufactured using the method defined by claim 37.

53. (new) A microlens substrate comprising a plurality of microlenses arranged on the substrate in an optically random order, the microlens substrate being manufactured using the substrate with a plurality of concave portions defined by claim 52.

54. (new) A transmission screen comprising the microlens substrate defined by claim 53.

55. (new) A rear projector comprising the transmission screen defined by claim 54.